The effects of acoustical refurbishment of classrooms on teachers' perceived noise exposure and noise-related health symptoms - DTU Orbit (08/11/2017)

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Objectives: To investigate whether acoustical refurbishment of classrooms for elementary and lower secondary grade pupils affected teachers' perceived noise exposure during teaching and noise-related health symptoms. *Methods:* Two schools (A and B) with a total of 102 teachers were subjected to an acoustical intervention. Accordingly, 36 classrooms (20 and 16 in school A and school B, respectively) were acoustically refurbished and 31 classrooms (16 and 15 in school A and school B, respectively) were not changed. Thirteen classrooms in school A were interim "sham" refurbished. Control measurements of RT and activity sound levels were measured before and after refurbishment. Data on perceived noise exposure, disturbance attributed to different noise sources, voice symptoms, and fatigue after work were collected over a year in a total of six consecutive questionnaires. *Results:* Refurbished classrooms were associated with lower perceived noise exposure and lower ratings of disturbance attributed to noise from equipment in the class compared with unrefurbished classrooms. No associations between the classroom refurbishment and health symptoms were observed. Before acoustical refurbishment, the mean classroom reverberation time was 0.68 (school A) and 0.57 (school B) and 0.55 s in sham refurbished classrooms. After refurbishment, the RT was approximately 0.4 s in both schools. Activity sound level measurements confirmed that the intervention had reduced the equivalent sound levels during lessons with circa 2 dB(A) in both schools. Conclusion: The acoustical refurbishment was associated with a reduction in classroom reverberation time and activity sound levels in both schools. The acoustical refurbishment was associated with a reduction in the teachers' perceived noise exposure, and reports of disturbance from equipment in the classroom decreased. There was no significant effect of the refurbishment on the teachers' voice symptoms or fatigue after work.

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Authors: Kristiansen, J. (Ekstern), Lund, S. P. (Ekstern), Persson, R. (Ekstern), Challi, R. (Ekstern), Lindskov, J. M. (Ekstern), Nielsen, P. M. (Ekstern), Larsen, P. K. (Ekstern), Toftum, J. (Intern)
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